

$$A \times B = \{(1, 1), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\} \quad (1)$$

$$B^r = \{(2, 2), (2, 3), (3, 2), (3, 3)\} \quad (2)$$

$$A \times B - B^r = (1) - (2) = \{(1, 2), (1, 3)\}$$

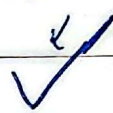
$$m^r = r + m \quad m^r - m = r \quad m(m-1) = r$$

۲- الف)

$$m_1 = 2 \quad m_2 = -1$$

$$\{(2, 1), (2, 4)\}$$

دستیابی ندارد



(1)

ب)

$$m^r = m + r \quad m^r - m = r \quad m(m-1) = r$$



$$m_1 = 2 \quad m_2 = -1$$

جواب درست نیست زیرا

$$\{(2, 4), (2, 1)\}$$

$$\{(-1, 4), (-1, 3)\}$$

دستیابی ندارد

م جوابی ندارد.

$$f(2) = 2a + b = 1$$

$$f(1) = 1 - 1 = a + b = 0$$

$$\begin{aligned} 2a + b &= a + a + b = 1 \\ a &= 1 \end{aligned}$$

$$\begin{aligned} a + b &= 0 \\ 1 + b &= 0 \\ b &= -1 \end{aligned}$$

$$a \times b = 1 \times -1 = -1$$

$$f(k) = rk - w = \varepsilon - wk$$

-ع

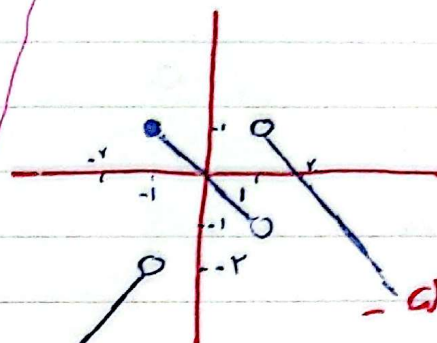
$$rk - w = \varepsilon - wk$$

$$wk = \varepsilon$$

$$k = \frac{\varepsilon}{w}$$

$$k = 1, \varepsilon$$

$$K = 1, \varepsilon$$



$$D_f = \mathbb{R} - \{1\}$$

$$R_f = (-\infty, 1]$$

$$x^2 + \varepsilon y^2 - 2x - 2y + 1 = 0$$

(ب)

$$(x^2 - 2x + 1) + (\varepsilon y^2 - 2y + 1) = 0$$

$$(x-1)^2 + (\varepsilon y - 1)^2 = 0$$

کامپیت

جمع ۲ عدد مثبت صفر نشده است

پس حتماً $x=1$ و $y=1$ بوده
پس تابع است.

$$x^2 + \varepsilon y^3 + 1 = 0$$

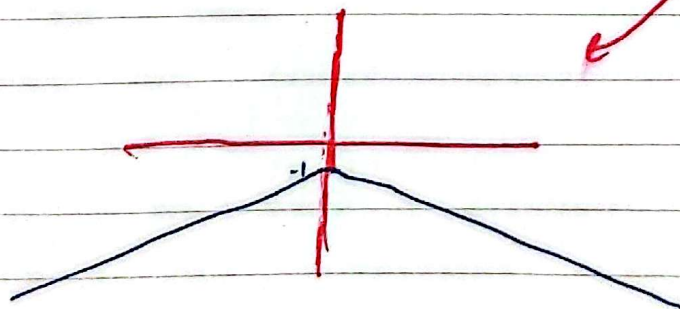
۶- الف)

$$= \frac{x^2 + 1}{\varepsilon} = y^3 \Rightarrow$$

$$1 - x^2 = \varepsilon y^3$$

$$y = \sqrt[3]{\frac{1 - x^2}{\varepsilon}} \Rightarrow y_1 = y_2$$

این تابع یک تابع است.



$$\delta_{in,1} = 0 \quad \delta_{in,0} = 0$$

۷- الف) روش مثال نقض

$$f(x) = x \times \delta_{in,y} = y \times \delta_{in,x}$$

۰، ۱، ۱

$$f(9) = 9 \times \delta_{in,0} = 0 \times \delta_{in,9}$$

$$y_1 \neq y_2$$

$$f(9) = 9 \times \delta_{in,1} = 1 \times \delta_{in,9}$$

این تابع نیست

ب)

$$0 < \sqrt{\frac{x}{y}} \quad \sqrt{\frac{x}{y}} = t$$

$$t + \frac{1}{t} = 2 \Rightarrow t + \frac{1}{t} - 2 = 0 \Rightarrow t^2 + 1 - 2t = 0 \Rightarrow (t-1)^2 = 0 \Rightarrow t = 1$$

$$y \quad x=y \quad \text{پس این یک تابع است} \quad \frac{x}{y} = 1$$

$$\{(x, y) \mid x=y, x \neq 0, x, y \in \mathbb{R}\}$$

$$D_f = \mathbb{R} - \{0\}$$

یعنی می‌تواند مفری باشد.
تابع است.

$$\sqrt{\frac{x-1}{x-2}} \geq 0$$

$$\begin{array}{l} x_1 = 1 \\ x_2 = 2 \end{array} \quad \frac{1}{x-1} - \frac{2}{x-2}$$

۱- الف) ①

$$D_f = (-\infty, 1] \cup (2, +\infty)$$

$$\sqrt{\frac{2-x}{x}} \geq 0$$

$$\begin{array}{l} x_1 = 2 \\ x_2 = 0 \end{array} \quad -\frac{2}{x} + \frac{1}{x-2}$$

②

$$D_f = [0, 2]$$

$$\textcircled{1} \cap \textcircled{2} \Rightarrow [0, 1]$$

$$D_f = [0, 1]$$

$$\sqrt{y-1} = \sqrt{x} \cdot \sqrt{x}$$

- ب و ا

$$y-1 = x + x - 2\sqrt{xx}$$

$$y = x + x - 2\sqrt{xx} \quad \frac{0}{0} \quad \frac{0}{+}$$

$$xx \geq 0$$

$$D_f = [0, +\infty)$$

$$y = \frac{\sqrt{x^2 - 2x + 4}}{\sqrt{x-1} \cdot x + 4} = \frac{\sqrt{(x-4)(x-1)}}{\sqrt{-9x+4}} \Rightarrow (x-4)(x-1) \geq 0 \quad \text{9- الف}$$

$$x_1 = 4 \quad x_2 = 1$$

①

$$(-\infty, 1] \cup [4, +\infty)$$

$$-9x+4 > 0 \Rightarrow -9x > -4$$

$$9x < 4$$

$$x < \frac{4}{9} \quad \text{②}$$

$$\textcircled{1} \cap \textcircled{2} = D_f = (-\infty, 1]$$

ب

$$\frac{x^2 - 2x + 4}{x^2 - 1 \cdot x + 4} \geq 0$$

$$\frac{(x-4)(x-1)}{(x-1)(x-2)} \geq 0$$

$$x_1 = 4 \quad x_2 = 1 \quad x_3 = 1 \quad x_4 = 2$$

$$\begin{array}{cccc} 1 & 2 & 4 & \wedge \\ + & - & + & - \\ \hline + & - & + & - \end{array}$$

$$D_f = (-\infty, 1] \cup [2, 4] \cup (1, +\infty)$$

dn

Date

No

$$2x^2 - 2x + 1 = 0 \Rightarrow x^2 - x + \frac{1}{2} = 0$$

(الف)

$$(x - \frac{1}{2})(x - \frac{1}{2}) = 0$$

$$x_1 = \frac{1}{2} = 0.5 \quad x_2 = \frac{1}{2} = 0.5$$

$$\textcircled{1} (-\infty, 0.5] \cup [0.5, +\infty)$$

$$3x^2 - 3x + 1 = 0 \Rightarrow x^2 - x + \frac{1}{3} = 0$$

$$(x - \frac{1}{3})(x - \frac{2}{3}) = 0$$

$$x_1 = \frac{1}{3} \quad x_2 = \frac{2}{3} = 0.666$$

$$+ \frac{1}{3} - \frac{2}{3} + \textcircled{2}$$

$$(-\infty, 1) \cup (\frac{2}{3}, +\infty)$$

$$\textcircled{1} \cap \textcircled{2} = D_f = (-\infty, 1) \cup (\frac{2}{3}, +\infty)$$

(ب)

$$\frac{2x^2 - 2x + 1}{3x^2 - 3x + 1} \geq 0$$

$$x^2 - x + (\frac{1}{3}) = 0$$

$$(x - \frac{1}{3})(x - \frac{2}{3}) = 0$$

$$x_1 = \frac{1}{3} = 0.333 \quad x_2 = \frac{2}{3} = 0.666$$

$$3x^2 - 3x + 1 \Rightarrow x^2 - x + \frac{1}{3} = 0$$

$$(x - \frac{1}{3})(x - \frac{2}{3}) = 0$$

$$x_1 = \frac{1}{3} \quad x_2 = \frac{2}{3} = 0.666$$

$$1, \frac{1}{3}, \frac{2}{3}, \frac{1}{3}$$

$$+ \frac{1}{3} - \frac{2}{3} + \frac{1}{3} +$$

$$D_f = (-\infty, 1) \cup (\frac{1}{3}, \frac{2}{3}) \cup [\frac{1}{3}, +\infty)$$